

## **The future of mankind and the problem of chemical bonding.**

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Given the chemistry, or rather the problem of chemical bond, which will be solved in the near future [1], you can quite accurately predict this near future (approximately 50 - 100 years).

So, let's say that work will be written that will make it possible to make an accurate theoretical calculation of chemical bond.

Then, after some time (after about 7 - 15 years), inevitably, there will be a physical and mathematical implementation. That is, the theoretical properties of a new substance that will not differ from experimental ones will be obtained on a specific example.

After that, new substances will no longer need to be synthesized in reality - virtual synthesis (theoretical calculation) completely and correctly describes the physical and chemical properties of new substances.

Therefore, the program will immediately be written and the calculation of new substances will begin, which will be carried out on computers constantly. Artificial intelligence will also be involved in the calculation.

Question: what will this lead to?

Answer: To an incredible increase in the number of described substances (that is, virtually synthesized).

Very quickly (the period of months and years) the number of substances will increase to billions and trillions.

For comparison, at the moment (July 1, 2023), the number of substances is 204 million, see the registry of the US Chemical Abstracts Service (CAS) [2]. I note that substances are synthesized in real laboratories. It is also interesting to observe the dynamics of change over the past 24 years.

“...May 24, 1999, the number of known chemical compounds exceeded 25 million, of which 12 million were organic, by May 2, 2014 the total number of known inorganic and organic compounds exceeded 87 million.

As of April 8, 2018, 141 million chemicals were registered in the register of the chemical abstract service of the United States (CAS)...” [3].

A hundred years ago, the number of substances was about a few hundred thousand (or so).

That is, with the advent of virtual synthesis, chemistry is completely and irreversibly transformed, since substances and materials with new properties will become available. Moreover, the number of such substances will be truly grandiose (billions and trillions).

Following chemistry (and in parallel with chemistry), medicine will also be transformed: new substances are new opportunities in the treatment of a wide variety of diseases, including previously incurable diseases.

The human environment will also change, because new materials and substances will “enter” our lives.

After some time (approximately 50 - 100 years) there will be no trace of our modern civilization - new materials and new individual substances will almost completely replace modern devices, materials and substances.

This can be compared with how the “electrical civilization” of the beginning of the 20th century differs from our modern “electronic civilization”. After 100 years, we use electricity in our devices, but the “internal filling” of devices and devices itself are unimaginably different from the instruments of the early 20th century (computers, smartphones, programs, cars, social networks, etc.).

Thus, in about 50 - 100 years, people will live in a different civilization. Absolutely different civilization (in meaning and material content). Surprisingly, based on chemistry, we can predict this quite accurately.

In fact, in the next 100 years, the “driving force” of civilization will be chemistry. The past 100 years “driving force” was physics. There were times when geography was “driving force”. Now the turn of chemistry has come. There is no doubt that humanity stands at the beginning of grandiose events in science and life.

1. Bezverkhniy V. D. Artificial Intelligence, Physical Substantiation of the Chemical Bond and Synthesis of New Substances. SSRN Electronic Journal, 3 Jan 2023. <https://dx.doi.org/10.2139/ssrn.4309742>
2. Chemical Abstracts Service (CAS). <https://www.cas.org/cas-data/cas-registry>
3. Organic chemistry. Wikipedia (ru). [https://en.wikipedia.org/wiki/Organic\\_chemistry](https://en.wikipedia.org/wiki/Organic_chemistry)